E317: Adaptive Resource Management for Embedded HPC

Multiple dynamic applications

Networked heterogeneous HPC platforms

Adaptation

Monitored performance

Other triggers

Enact

Desired performance

Detect shortfall → Trigger → Negotiate → Allocate
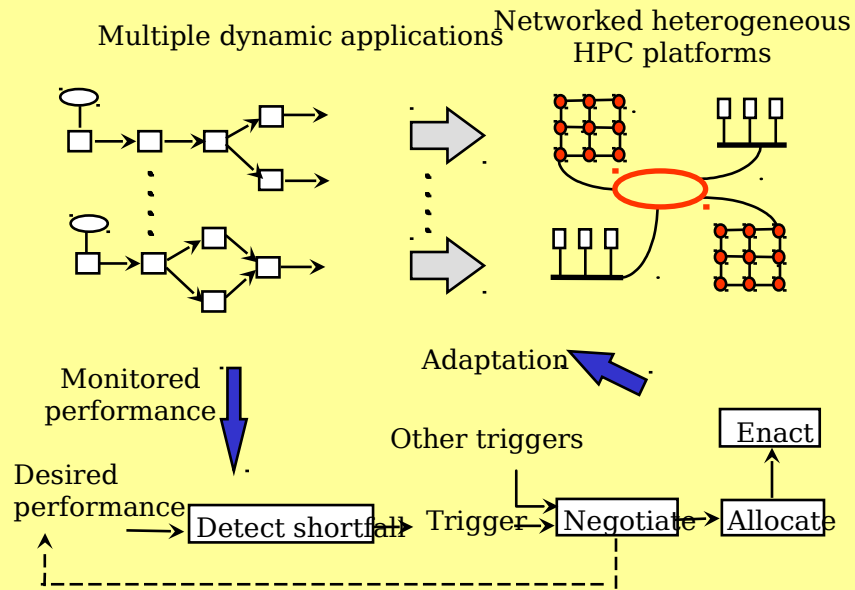
NEW IDEAS

1. **On-line monitoring** of runtime run-time behavior,
   for **continual (re)allocation** of resources.

2. **Incremental (re)allocation algorithms and**
   QoS negotiation protocols.

3. **Plug and play architecture** based on separating
   adaptation models from run-time support.

IMPACT

1. **Deliver aggregate computing power** of
   distributed computing resources to multiple
   application systems.

2. Enable **adaptive and agile applications** that
   reconfigure themselves in response to drivers
   such as performance, algorithm adaptation,
   faults, discovery of new resources

SCHEDULE

Date	Milestone
10/96	Program Kickoff
06/97	QoS architecture design
11/97	Admission control + adaptation
04/98	Prototype negotiation protocol
12/98	Adaptation models
05/99	Incorporate into AO# F216